CLAIMS

It is claimed:

1. For imaging a target object, an imaging system comprising:

a first beam splitter configured to substantially transmit part of received light as first transmitted light and to substantially reflect part of received light as first reflected light;

a defocus system configured to modify optical power of substantially one of the following: the first transmitted light and the first reflected light, and to transmit the same as first transmitted defocused light;

a reflector configured to reflect one of the following: the first reflected light and the first transmitted defocused light;

a second beam splitter configured to substantially transmit part of one of the following: the first transmitted light as second transmitted light and the first transmitted defocused light as second transmitted defocused light and configured to substantially reflect part of one of the following: the first transmitted defocused light as second reflected defocused light and the first reflected light as second reflected light; and

an imaging sub-system configured to focus one of the following pairs of light: the pair of the second transmitted light as imaged unaltered light and the second reflected defocused light, as imaged defocused light and the pair of the second transmitted defocused light as imaged defocused light and the second reflected light as imaged unaltered light and to focus the imaged defocused light with respect to an imaged defocused image plane and the imaged unaltered light with respect to an imaged unaltered image plane separated from the imaged defocused image plane, the second beam splitter oriented according to a mechanical angle such the imaged unaltered light and the imaged defocused light have an angular separation other than zero.

2. The system of claim 1 wherein second beam splitter further configured to transmit part of the first reflected light and reflected part of the first transmitted light.

3 The system of claim 1 wherein the defocus system is a negative lens.

4 The system of claim 1, further comprising a collection system wherein the collection system is a lens.

5 The system of claim 1, further comprising an optical retardation plate and wherein the second beam splitter is a polarization beam splitter having a polarization beam splitter optical coating

6 The system of claim 1 wherein the imaging sub-system is an imaging lens

7 The system of claim 1 wherein the first beam splitter and the second beam splitter are polarization beam splitters having polarization beam splitter optical coatings.

8 The system of claim 1, further comprising a second imaging sub-system and a second detector.

9. The system of claim 1 wherein the detector has first and second focus areas.

10. The system of claim 1, further comprising a spectral dispersing element configured to transmit light to the imaging sub-system.

11. The system of claim 1, further comprising:

a secondly-oriented first beam splitter configured to substantially transmit part of the collected light as first transmitted light and to substantially reflect part of the collected light as first reflected light;

a secondly-oriented defocus system configured to modify optical power of substantially one of the following: the first transmitted light and the first reflected light to transmit as defocused light;

a secondly-oriented reflector configured to reflect one of the following: the first reflected light and the defocused light;

a secondly-oriented second beam splitter configured to substantially transmit part of one of the following: the first transmitted light as second transmitted first transmitted light and the defocused light as second transmitted defocused light and configured to substantially reflect one of the following: the defocused light as second reflected defocused light and the first reflected light as second reflected first reflected light;

a secondly-oriented imaging sub-system configured to focus one of the following pairs of light: the pair of the second transmitted first transmitted light as imaged unaltered light and the second reflected defocused light as imaged defocused light and the pair of the second transmitted defocused light as imaged defocused light and the second reflected first reflected light as imaged unaltered light and to focus the imaged defocused light with respect to a imaged defocused image plane and the imaged unaltered light with respect to an imaged unaltered plane being separated from the imaged defocused plane; and

a secondly-oriented first detector positioned to receive the imaged defocused light and the imaged unaltered light, the secondly-oriented second beam splitter oriented according to a mechanical angle such the unaltered light and the defocused light have an angular separation..

12. The system of claim 1, further including a first detector.

13. For imaging a target object, an imaging system comprising:

a first beam splitter configured to substantially transmit part of collected light as first transmitted light and to substantially reflect part of collected light as first reflected light;

a defocus system configured to modify optical power of substantially one of the following: the first transmitted light and the first reflected light to transmit as defocused light;